

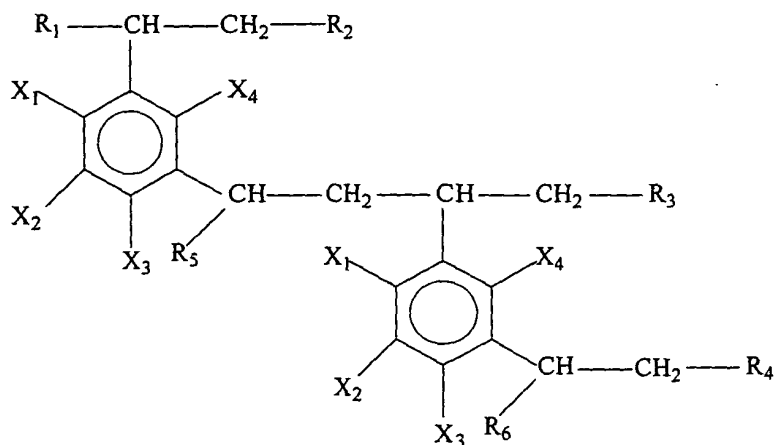
We claim:

1. Highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polyamine-functionalized polymers.
2. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polyamine-functionalized polymers of claim 1 wherein said polymer forms micro-beads.
3. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polyamine-functionalized polymers of claim 1 wherein said polymer forms amorphous masses.
4. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polyamine-functionalized polymers of claim 2 wherein said micro-beads have diameters ranging from approximately 1  $\mu\text{m}$  to approximately 100  $\mu\text{m}$ .
5. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polyamine-functionalized polymers of claim 2 wherein said micro-beads have pores.
6. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polyamine-functionalized polymers of claim 5 wherein said micro-beads have pores ranging in size from approximately 5 to 500,000 Å.
7. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polyamine-functionalized polymers of claim 3 wherein said amorphous masses have pores.
8. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polyamine-functionalized polymers of

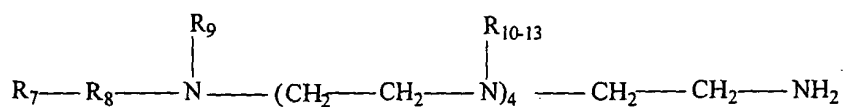
claim 3 wherein said amorphous masses have pores ranging in size from approximately ranging from 5 to 500,000 Å.

9. A highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated pentaethylene hexamine derivatized form of polydivinylbenzene according to Claims 1 thru 8.
10. A highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible methoxymethyl-protected monodiazoniumdiolate of piperazine derivatized form of polydivinylbenzene according to Claims 1 thru 8.
11. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of claim 9 or 10 further comprising a micro-bead having a diameter ranging from 1  $\mu\text{m}$  to approximately 100  $\mu\text{m}$ .
12. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of claim 9 or 10 further comprising a micro-bead having pores ranging in size from approximately ranging from 5 to 500,000 Å.
13. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of claim 9 or 10 further comprising amorphous masses having pores ranging in size from approximately ranging from 5 to 500,000 Å.
14. A highly cross-linked, extremely hydrophobic nitric oxide releasing biocompatible polymer wherein said biocompatible polymer is a polyamine derivatized form of polydivinylbenzene having the general formula:

(1)



Wherein  $R_1$  through  $R_4$  are the same or different and may be H, phenyl, benzyl, vinylbenzene, divinylbenzene un-substituted and substituted alkyl and substituted and un-substituted aryl groups,  $X_{1-4}$  are same or different and may be H, a halogen, an un-substituted or substituted alkyl and substituted or unsubstituted aryl groups providing that the resulting polymeric backbone remains hydrophobic and wherein at least one of  $R_5$  and  $R_6$  is:



wherein  $R_7$  is a hydrophobic polymer backbone,  $R_8$  may be nothing or a  $C_{1-12}$  unbranched or branched alkyl group and  $R_{9-13}$  may be H or  $N_2O_2^-$  providing that at least one of  $R_{9-13}$  is  $N_2O_2^-$ .

15. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of claim 14 wherein said polymer forms micro-beads.
16. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of claim 14 wherein said polymer forms amorphous masses.
17. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of claim 14 wherein said micro-beads have diameters ranging from approximately 1  $\mu\text{m}$  to approximately 100  $\mu\text{m}$ .
18. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of claim 14 wherein said micro-beads have pores.
19. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of claim 14 wherein said micro-beads have pores ranging in size from approximately 5 to 500,000 Å.
20. The highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of claim 14 wherein said amorphous masses have pores ranging in size from approximately 5 to 500,000 Å.
21. A therapeutic agent comprising the highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymers of any one of claims 1 through 8 or 14 through 20.
22. A medical device comprising a highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymer, said medical device selected from the group consisting of stents, vascular grafts, pacemaker leads, heart valves, electrodes, sensors, trocars, guide wires, catheters, penile implants, condoms, tampons, sanitary napkins, ocular lenses, sling materials, sutures, wound dressings/bandages, blood collection bags and storage tubes, tubing

used for blood transfusions and hemodialysis, and the like according to any one of claims 1 through 8 or 14 through 20.

23. A medical device coating comprising a highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polymer, said medical device coating selected from the group consisting of stents, vascular grafts, pacemaker leads, heart valves, electrodes, sensors, trocars, guide wires, catheters, penile implants, condoms, tampons, sanitary napkins, ocular lenses, sling materials, sutures, wound dressings/bandages, blood collection bags and storage tubes, tubing used for blood transfusions and hemodialysis, and the like according to any one of claims 1 through 8 or 14 through 20.
24. A therapeutic agent comprising the highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymers according to any one of claims 1 through 8 or 14 through 20.
25. A medical device comprising a highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymer, said medical device selected from the group consisting of stents, vascular grafts, pacemaker leads, heart valves, electrodes, sensors, trocars, guide wires, catheters, penile implants, condoms, tampons, sanitary napkins, ocular lenses, sling materials, sutures, wound dressings/bandages, blood collection bags and storage tubes, tubing used for blood transfusions and hemodialysis, and the like according to any one of claims 1 through 8 or 14 through 20.
26. A medical device coating comprising a highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymer, said medical device coating selected from the group consisting of stents, vascular grafts, pacemaker leads, heart valves, electrodes, sensors, trocars, guide wires, catheters, penile implants, condoms, tampons, sanitary napkins, ocular lenses, sling materials, sutures, wound dressings/bandages,

blood collection bags and storage tubes, tubing used for blood transfusions and hemodialysis, and the like according to any one of claims 1 through 8 or 14 through 20.

27. A method for treating ischemia in a human or an animal comprising:  
administering to said human or animal a highly cross-linked, extremely hydrophobic nitric oxide-releasing polydiazoniumdiolated biocompatible polymer containing medical device to a specific location within said human or animal.
28. The method for treating ischemia in a human or an animal of claim 27 wherein said highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymer containing medical device is a vascular stent.
29. A method for treating ischemia in a human or an animal of claim 28 wherein said highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymer comprises the intravascular administration of micro-beads of a diameter of 1 to 20  $\mu\text{m}$  and porosity 5 to 100,000 Å.
30. A method for treating ischemia in a human or an animal of claim 28 wherein said highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymer comprises the intravascular administration of amorphous masses of a diameter of 1 to 20  $\mu\text{m}$  and porosity 5 to 100,000 Å.
31. The method for treating ischemia in a human or an animal of claim 28 wherein said highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymer comprises the introduction into

the pericardial sac micro-beads of a diameter of 1 to 20  $\mu\text{m}$  and porosity 5 to 100,000 Å.

32. The method for treating ischemia in a human or an animal of claim 28 wherein said highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymer comprises the introduction into the pericardial sac amorphous masses of a diameter of 1 to 20  $\mu\text{m}$  and porosity 5 to 100,000 Å.
33. A method for treating infections in a human or an animal wherein said highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymer comprises a stent, trocar, guide wire, tampon, sanitary napkin, wound dressing/bandage, vascular graft, sutures, and the like.
34. A method that prevents blood coagulation and maintains an aseptic environment during blood transfusions, hemodialysis, and the administration of other blood components via tubing for a human or an animal comprising: blending or co-polymerizing tubing with highly cross-linked, extremely hydrophobic biocompatible polydiazoniumdiolated polymers.
35. A method for storing mammalian blood thrombocytes comprising a collection and storage device that prevents blood coagulation and maintains an aseptic environment for human or animal blood comprising:  
collecting fresh blood;  
separating said thrombocytes from said blood;  
placing said isolated thrombocytes into a blood storage bag comprising a highly cross-linked, extremely hydrophobic nitric oxide-releasing biocompatible polydiazoniumdiolated polymer.